NASA TECHNICAL TRANSLATION | NASA TT F-14,695

THREE STUDIES (FRENCH, BRITISH, GERMAN) CONCLUDE: 40 TO 50 CIVILIAN GEOSTATIONARY SATELLITES TO BE LAUNCHED BETWEEN 1980 AND 1990

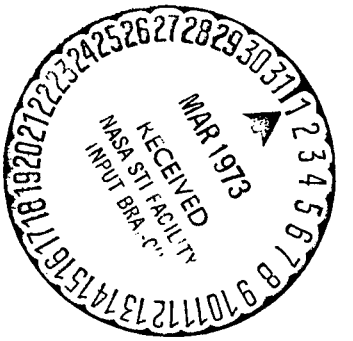
P. Longereau

(NASA-TT-F-14695) THREE STUDIES (FRENCH, BRITISH, GERMAN) CONCLUDE: 40 TO 50 CIVILIAN GEOSTATIONARY SATELLITES TO BE LAUNCHED BETWEEN 1980 AND 1990 (Techtran Corp.) 6 p HC $3.00 CSCL 22B G3/31 62838

N73-17887

Unclas

Translation of "Trois études (française, britannique, allemande) concluent: 40 à 50 satellites géostationaires civils à lancer entre 1980-1990," Air et Cosmos, No. 461, Dec. 16, 1972, pp. 38 and 48



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D. C. 20546 FEBRUARY 1973

STANDARD TITLE PAGE

1. Report No. NASA TT F-14,695	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle THREE STUDIES (FRENCH, BRITISH, GERMAN) CONCLUDE: 40 TO 50 CIVILIAN GEOSTATIONARY SATELLITES TO BE LAUNCHED BETWEEN 1980 AND 1990		5. Report Date January 30, 1973 6. Performing Organization Code
7. Author(s) P. Longereau		8. Performing Organization Report No. 10. Work Unit No.
9. Performing Organization Name and Address Techtran Corp. P.O. Box 729 Glen Burnie, Md. 21061		11. Contract or Grant No. NASW-2485 13. Type of Report and Period Covered Technical Translation
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D. C. 20546		14. Sponsoring Agency Code

15. Supplementary Notes

Translation of "Trois études (française, britannique, allemande) concluent: 40 à 50 satellites géostationaires civils à lancer entre 1980-1990," Air et Cosmos, No. 461, Dec. 16, 1972, pp 38 and 48

16. Abstract

A total of 41 to 53 geostationary satellites will be launched between 1980 and 1990 to serve telecommunications, television and navigation needs.

17. Key Words (Selected by Author(s))	18. Distribution Statement
	Unclassified-Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified		3.00

THREE STUDIES (FRENCH, BRITISH, GERMAN) CONCLUDE: 40 TO 50 CIVILIAN GEOSTATIONARY SATELLITES TO BE LAUNCHED BETWEEN 1980 AND 1990

P. Longereau

/38*

The successor to the current European launcher will place approximately 750 kilos in a geostationary orbit. This mass represents the weight of the satellite proper, after operation of the apogee motor whose mass is essentially the same as that of the satellite. This amounts to placing in orbit a mass of approximately 1500 to 1550 kilos in a transfer orbit of 200-36,000 kilometers.

This objective was established several years ago with consideration of the priority mission of Europe in space: the telecommunications satellite of the 1980's, which was then defined by the European Postal and Telecommunications Conference and the European Radio Broadcasting Union in order to satisfy their respective needs. These are classical telecommunications (telephone, Telex, data transmission, telegraph, etc.) and television transmission using the national ground stations of the existing Intelsat network. (An antenna 30 m in diameter with a quality factor G/T of 40dB/°K).

Although the definition of the European telecommunications satellite has gained rather large proportions, the ultimate objective has remained pratically unchanged. All future launching projects following "Europa 2" have been devised with this objective in mind.

Five "Systems" of Satellites Weighing 450 or 500 kg

In order to get a better idea of the utilization of the future launcher, three studies have been carried out in May-June 1972 in three countries separately (Great Britain, Germany and France) concerning the period from 1980 to 1990, with the first date corresponding to the availability of the launcher..

These studies encompassed only applications geostationary satellites with the exception of scientific and military satellites. In 1980-1990,

*Numbers in the margin indicate pagination in the foreign text.

most of the scientific satellites will be capable of launching by the "space shuttle" as in the United States. The European military and telecommunications satellites, as well as those used for reconnaissance and navigation, will probably be in existence in the time in question, but today no exact information about the objectives of the major powers has been supplied officially. Let us mention them for the record.

A French-German group was formed to attempt to reach a common solution, but was dissolved when Paris and Bonn were unable to agree on the subject of launchers. Work then went forward on the French side, mainly to deal with the development of the European telecommunications satellite project.

Satellites were divided into two categories: 450 kg satellites for the period 1980-1985 and 700-750 kg satellites for 1985-1990, all of them using the same basic launcher.

The studies took into account the launching of the following satellites to be used in service and in the intermediate ten-year period for space "systems": telecommunications, meteorology, control of air traffic, control of maritime traffic, direct transmission of television. The principle was to keep two satellites permanently in orbit, one in service and the other on a standby basis. A third satellite in reserve on the ground could be launched immediately in case of failure of one of the others. The program would go forward in the following fashion:

— Telecommunications: For the intra-European telephone traffic of the CEPT and the Mediterranean T.V. traffic of the UER, the program would be realized in three stages. Initially, an experimental satellite weighing 350 kg (not calculated) would be launched by 1977 and would be very similar to the operational satellite. The operational satellites would be of two types: three to four satellites weighing 450 kg for the period 1980-1985 and three to four others weighing 700 k for the period from 1985 to 1990 (all planned for a lifetime of ten years);

— Meteorology: The hypothesis is that Europe will participate in the World Meteorological Watch for Europe, Africa and the Atlantic using satellites

derived directly from the "Meteosat" which is currently under construction. There would have to be seven to eight operational satellites weighing 450 kg (life time of only three years) for the decade;

— Monitoring of air traffic: Here again Europe would participate in the launching and maintenance of a worldwide system which would cover the three oceans permanently with five satellites in service (two over the Atlantic, two over the Pacific, and one over the Indian Ocean). The United States would surely play an important part in this system. The European participation is estimated to consist of four to five satellites weighing 450 kg for 1980-1985 and four to five others weighing 700 kg for 1985-1990;

— Monitoring of maritime navigation: Less advanced than the others, this project is currently underway, mainly under the impetus of the USSR. On the technical level, these satellites will be very similar to those that have existed until now. For its part, Europe will be able to furnish three to four satellites weighing 450 kg between 1980-1985 and three to four others weighing 700 kg for 1985-1990.

These estimates have nothing in their principles which is *a priori* of a utopian nature. In each of the areas discussed, experimental satellites are currently under development or being studied. Therefore it seems logical to expect that they will be used in operational systems in the years to come.

Direct Television Transmission and Exportation

The direct television transmission of T.V. programs has become a reality, mainly under the impetus of Germany which plans to have such a system available by 1983 and more recently by Great Britain. The authors of these studies have estimated that in addition to these two countries, France, Scandanavia, Italy and even Spain will be able to take part in such systems in the near future. Direct television transmitting satellites, by providing reception through small individual or community antennas, will make it possible for everyone to listen to the satellites and will suppress the direct control of the authorities. In effect, this will be of tremendous political impact. We have already seen the very vociferous statements of the Soviet Union as far as this means of transmission is concerned. We must therefore expect a

chain reaction when systems first go into service in an area. Bordering countries will then be directly concerned by the fact that the areas of coverage of satellites will forcibly break down the frontiers.

It is obviously difficult at this point to evaluate precisely the developments of these satellites. Their progress will be limited to a certain degree by the development of cable television, at least in the areas with the highest population density. The hypothesis which is still maintained for Europe, however, calls for at least two systems between 1983 and 1990, at least six to eight operational satellites weighing 700 kg which will certainly be preceded by two to three experimental satellites weighing 450 to 500 kg between 1980 and 1983.

/48

In addition, the authors have also foreseen the exportation of direct T.V. transmissions between 1985 and 1990--in Africa and in South America for example--which will represent approximately six to eight satellites in addition which will weigh 700 kg.

The total estimates are therefore calling for 19 to 24 satellites weighing 450 kg and 22 to 29 satellites weighing 700 kg, in other words a volume of 41 to 53 satellites for geostationary applications which will be launched in the ten years between 1980 and 1990.

Translated for the National Aeronautics and Space Administration under contract No. NASw-2485 by Techtran Corporation, P. O. Box 729, Glen Burnie, Maryland, 21061.